

The Effect of Gender Differences in Information Processing: In Relation to Advertising Appeals Order

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Abstract

This article explores the effects of gender differences in information processing on web-based advertising appeal order. Previous research has demonstrated that males process technical product information in rational forms better than females, who in turn process technical product information better when presented in verbal prose or graphic forms. To investigate customer advertising attitudes along with individual advertising exposure on a website, the author measures gender-based differences in attitude towards different orderings of advertising presentation. The results show significant relationships between the variables, and support the hypothesis that males prefer rational information first, while females prefer emotional information first. Managerial implications for ad execution are discussed and future research suggestions are proposed.

Keywords

Appeal Order; Information Processing; Person and Product Involvement

Introduction

Numerous studies have investigated how gender differences affect preferred information processing strategies, such as verbally- or visually-oriented strategies, for persuasive appeals on various types of media. For example, there is some evidence to suggest that males process technical product information in rational forms better than females because logical depictions are more conducive to right-hemisphere processing. In contrast, females process technical product information better when presented in verbal prose, which is more compatible with left-hemisphere processing (Meyers-Levy, 1993). These results suggest that women and men differ in their evaluation of information content, as well as in their abilities to

process the visual presentations used in ads.

Further, numerous studies on gender differences pertaining to the use of the internet and online purchasing habits exist (Bernanke, 2009; Kehoe, Pitkow and Morton, 1997; Sheehan, 1999) however, these empirical studies do not explain why web-based promotional ads impact the two genders differently. To fill the gap, this research is specifically interested in discovering how information searches, personal and product involvement, and affinity for the presenting order of visual ad appeals influence the effectiveness of banner ads.

The purpose of this study is to explore how gender-based differences in information processing strategies affect web advertising attitudes. Through an online experiment, the research investigates whether genders exhibit different attitudes towards advertising appeals presented in different orders. Moreover, by re-examining several existing theories on the effects of traditional media advertising, the study then explores to explain differences in gender-based information processing of web advertising. The findings and contributions offer explanations regarding gender-based information processing effects, as well as implications for future research in advertising appeals strategy and message placement.

Theoretical Background

The identification and measurement of gender differences in information processing are important for two main reasons. The first is that with a better understanding of these relationships, more effective consumer information systems can be developed. The

second is that measuring the propensity for using various forms of consumer information, such as the order of ad appeals, can lead to changes in how information is presented.

Rodgers and Sheldon (1999) found that male students in the US reported better overall attitudes toward e-shopping than female students. In addition, males are thought to be more likely than females to search online for product or service information (Lengyel, 2009; Rodgers and Harris, 2003) and also exhibit more positive attitudes towards web-based advertising in general as compared to females due to the sense of interactivity (O'Donohue, 1995). Research has argued that because women do not use the internet to the same degree as men, they are also unlikely to have the time to learn about new technologies such as the Internet (DeBare, 1996). According to Companion and Sambrook (2008), male processing exhibits effortful elaboration of the message content, while female processing tends to focus on peripheral cues. Possible reasons for this difference in information processing are that females are more likely to engage in an easily comprehensive elaboration, and that they are more emotionally attached to the messages than males (Barone, Palan and Miniard, 2004).

The level of user involvement is the predominant factor that determines whether consumers exposed to a web-based ad will choose to click on that advertising. Pavlou and Stewart (2000) suggested the importance of user involvement when examining the effectiveness of web-based advertising. In high-involvement situations, consumers exhibit high motivation to process advertising messages due to elevated personal relevance or product category involvement; as such, consumers are more likely to demand additional information to satisfy their intrinsic cognitive needs. In contrast, consumers in low involvement situations experience low motivation to process advertising messages, meaning that they are unlikely to request additional information. (However, they may follow the peripheral route to voluntary exposure, which still results in an eventual ad click.) When consumers are not highly motivated to process further ad content, they are unlikely to engage in message-related thinking; as such, they are more likely to focus on available peripheral cues. In other words, the attractiveness of peripheral cues influences the likelihood of web-based ad clicks in low-involvement situations.

Advertising studies featuring high-involvement

products provide strong support for a link between rational personality traits and attitude formation. The majority of people show more favourable attitudes towards rational appeal ads for high-involvement products, but report unfavourable attitudes towards emotional appeal advertisements for the same type of products (Sheldon, 1994). An emotional advertising appeal differs from a more functional one in terms of components, including an attention-getting animation/image, a positive/negative emotional stimulation and an attractive visual text string or graphic. As such, emotional appeal ads focus on symbolic, attractive attributes and peripheral cues (e.g. celebrities, bright colours or advertising exposure intensity) (Lengyel, 2009; Johar and Sirgy, 1990).

Although the internet is comprised of nearly equal numbers of males and females, more men than women are using the internet for online business transactions and purchases (Brunel and Nelson, 2003). If women are the primary shoppers of brick-and-mortar establishments, then it stands to reason that they would also be the primary shoppers in a virtual environment. But they are not. Why? A general reason underlying gender differences may relate to perceptual differences between men and women. Perceptions are a key concept in psychological theory and in the practice of marketing. Meyers-Levy's (1993) findings claim that males rely heavily on global rules and other categorical concepts in processing information, whereas females primarily rely on different way of processing, which concerns the specificities and are implied by stimulus information. If this is true, then we might expect differences in the manner in which males/females perceive persuasion from online Web ads. In the concept of gender difference, a female is likely to engage in an easily comprehended elaboration and is more emotionally attached to the messages than a male.

In terms of advertising order effects, two main facets have been discussed previously: *primacy and recency*. Primacy can be characterized as "get to your side of the argument first", while a recency effect occurs when the final communication has the greatest consequence on persuasion, based on "having the last word" (Lana, 1963). That is, primacy effects should be most likely when interest/motivation are high and information is processed centrally, while recency effects should be present when interest/motivation are low and information is processed peripherally. In contrast to more traditional types of media, web users can control the level of interactivity, and even choose

whether or not to interact with the web-based ad; as such, it is somewhat meaningless to discuss gender-based preferences to appeals within a low involvement situation, as it is unlikely that the user will pay attention to the presentation order of the appeal. Based on the above, we now present the research question (Q) and our hypothesis (H):

Q: *What are the gender-based attitudinal differences towards an online ad presented in different orders (emotional first or rational first) for a highly personal product involvement situation?*

H: *For a high-involvement product, men will prefer a web-based advertisement better when a rational appeal is presented prior to an emotional appeal as compared to one where the presentation order is reversed. The same applies to women; however, the result will be reversed (they will prefer an emotional appeal prior to a rational appeal).*

Methodology

To test our expectations concerning advertising appeal order effects, the study used an ANOVA experiment to guide the systematic analysis procedure. We collected online feedback by cooperating with a well-known website (www.payeasy.com.tw) rated by PChome as one of the top 10 shopping websites in Taiwan (www.pchome.com.tw/2011-05-12.phtml). Emails requesting participation were randomly sent to the website's newsletter subscribers as listed in the database. Interface designs, layers of information, and layouts for internet advertisements were standardized to control for potential confounding variables. Different internet advertisements were removed extraneous factors when existing internet advertisements were used. Manipulations including product photos, fictional brand names, and fictional product descriptions were created to correspond to product characteristics and advertising appeals.

The dependent variable was web advertising attitude; the independent variable in this study was appeal order (rational first vs. emotional first). Further, this study included three moderators: (1) level of personal and product involvement (high vs. low), (2) gender (male vs. female), and (3) personal and product involvement level (specified here as virtual products in an online environment).

We evaluated the content validity of the constructs by performing a pre-test with 150 college students randomly chosen from TransWorld University and 150

working adults—all with online shopping experience. The pre-test survey sites were hyperlinked to our university intranet. The experimental sites included separate between-group subject designs, where each subject was randomly exposed to either of the experimental treatments. Subjects were told that the purpose of the study was to evaluate a new website ad. Each website was embedded with a uniquely formatted web advertising presentation; following exposure to the ad, participants were asked to click a link that led to a website containing the questionnaire.

Before each subject was exposed to the experimental material, we measured their levels of involvement. Rather than considering only one aspect of involvement, a multiple-indicator measure consisting of "personal and product involvement" was constructed. The 15 items pertained to five dichotomies: *interesting/boring*, *risk probability/no risk probability*, *pleasure/no pleasure*, *risk important/ risk not important*, *symbol/no symbol*. The questions were similar to those used to measure personal involvement in earlier studies (Beatty and Smith, 1987); the reliability of the "personal and product involvement" construct was $\alpha = 0.73$. To measure the level of involvement, we included 21 product categories (e.g. cellular phones, clothing, cameras, sunglasses, shoes, bicycles, books and toys, among others). As it has mentioned above, it is somewhat meaningless to discuss gender-based preferences to appeals within a low involvement situation, as it is unlikely that the user will pay attention to the presentation order of the appeal. The pre-test results showed that the cellular phone had the highest involvement ($X_{\text{mean}} = 6.27$, $p < 0.01$). The high-involvement product chosen based on pre-test results in this study was a virtual cellular phone "iMod-W950i".

Participants rated themselves on the self-referencing items after viewing the advertisement. The reliability of the rational appeal was $\alpha = 0.81$, the reliability of the emotional appeal was $\alpha = 0.80$ and the t values were significant. Also, we examined whether the participants identified with the ordering of the advertising appeal to the same degree. For the rational appeal first ad, the mean score on the first item was $X_{\text{mean}}(299) = 6.17$, and on the second item was $X_{\text{mean}}(299) = 5.97$. For the emotional appeal first ad, the mean score on the first item was $X_{\text{mean}}(299) = 6.17$, and on the second item was $X_{\text{mean}}(299) = 6.24$; also, the t values were all significant. As such, the subjects did not differ in terms of their views on the ordering of the appeals. As for the manipulated advertising attitude,

the reliability of the construct was $\alpha = 0.89$; as such, it met the critical standard of 0.70.

Following the pre-test, we designed different web-based ads for the cellular phone and toy. Each subject from the two groups (male/female) was randomly assigned to a cell, and each experimental group was asked to complete a two-part questionnaire. In part 1, each subject answered questions after viewing the ads placed on each website. First, each subject was exposed to the initial web-based ad, and was then asked to respond to the items of constructs to measure his/her attitude toward the ad.

After completing part 1, each subject was asked to continue with part 2 of the questionnaire, which pertained to demographic information. In total, each participant needed approximately 10 minutes to complete both parts.

Prizes (10 i-Pod Nano) were offered to randomly selected winners from all completed questionnaires received and sent to the address listed in the database. To prevent multiple replies, respondents had to enter an account number, a password and their identification number to participate. If respondents attempted to respond more than once, they received a programmed response that stated *"Sorry, you have already completed this questionnaire! You may not complete it again."*

Consumer attitudes toward ads are affected by factors including congruence of the web and other salient factors (e.g. online experience and brand loyalty, among others) that affect consumers' overall perceptions. However, as the major purpose of this study was to investigate the main and interactive effects of advertising appeals, appeal ordering,

personal and product involvement levels and gender differences, we chose subjects with online experience and designated other variables (e.g. brand loyalty, product information searching and limited control over site features) as control variables.

In terms of sample characteristics, an e-mail was sent to prospective participants with online experience in database (nearly 32,000), and 1,713 people completed the online questionnaire, for a response rate of 5.35%. The online survey period was from May 1, 2011 until May 31, 2011.

Out of the 1,713 completed responses, 1,685 were deemed usable for our analysis. The other responses were either incomplete or classified as outliers. Females composed 50.3% (848) of the total sample. The majority (67.5%) of the subjects were between 20-40 years of age, with a mean age of 28.5 years. Demographically, male and female respondents were similar in terms of age ($\chi^2 (5) = 2.35, p > 0.1$) and also had attained similar levels of education (approximately 71% of both men and women had received college degrees; $\chi^2 (3) = 4.52, p > 0.1$). Also, participants exhibited similar online purchase frequencies, regardless of gender ($\chi^2 (3) = 2.11, p > 0.1$).

Results

An analysis of variance (ANOVA) was conducted; the overall interactions were strong and showed support for the hypothesis. We found a significant difference in the main effect of the ordering of appeals ($F = 42.52, p < .01$). Further, the ANOVA results indicated significant differences in terms of gender and ordering of appeals ($F = 350.78, p < .01$), as depicted in Table 1.

TABLE 1 WITHIN-SUBJECT ANOVA TEST RESULT

Source	Type III Sum of Squares	Df.	Mean Square	F value	Significant
Gender	.118	1	.118	.220	.640
error (Gender)	965.512	1684	.568		
Appeal Order	20.791	1	20.791	42.52	.000**
error (Order)	823.476	1684	.489		
Gender * Order	166.272	1	166.272	350.78	.000**
error(Gender*Order)	798.216	1684	.474		

** $p < 0.01$, * $p < 0.05$

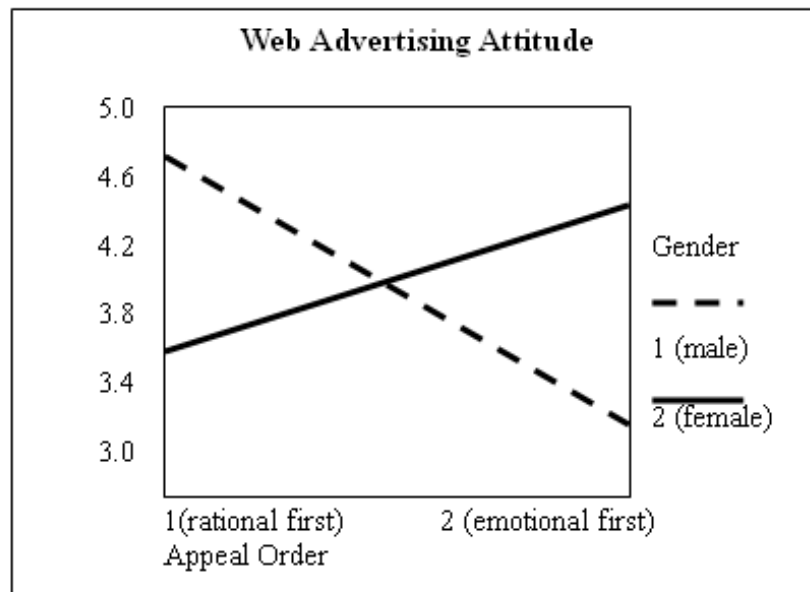


FIGURE 1 INTERCEPTION EFFECT OF GENDER AND APPEAL ORDER

Note: 1.male and rational appeal first; 2.female and emotional appeal first

Moreover, Figure 1 shows that men exhibit more positive web-based advertising attitudes when the ad employs a rational appeal first than do women ($X\text{-mean}_{\text{rational-first}}=4.72$, $p<.01$ vs. $X\text{-mean}_{\text{emotional-first}}=3.01$, $p<.01$ the difference is statistically significant). As such, we can say that for a high-involvement product, men prefer advertisements that include a rational appeal prior to an emotional appeal. For women, the results are reversed ($X\text{-mean}_{\text{rational-first}}=3.48$, $p<.01$ vs. $X\text{-mean}_{\text{emotional-first}}=4.34$, $p<.01$ the difference is statistically significant); they prefer to see emotional appeals prior to rational appeals. These results support the hypothesis.

Conclusions and Discussion

Gender differences have been of interest to advertisers and marketers for decades. Although the internet is comprised of nearly equal numbers of males and females, more men than women are using the internet for online business transactions and purchases (O'Donohue, 1995). This pattern of web use leaves questions as to just how viable this channel is for female shoppers, even though reasons for the trend have gone virtually unexplored in the literature. Thus, the purpose of this research is to provide insights into the antecedents that influence male/female web-based advertising attitudes and to test the proposed interrelationships based on the information processing aspect.

The results of the online survey of internet users support the hypothesis, and in turn suggest several implications. First, the results of the experiment show support for the hypothesis (for a high-involvement product, men prefer to be exposed to a rational appeal first, while women prefer initial exposure to an emotional appeal). This useful finding may help to explain why women enjoy ads that include vivid animation (Companion and Sambrook, 2008). Web-based advertisers should target females directly with animated advertising to induce them to shop.

Second, while our findings are compelling from both empirical and theoretical standpoints, the relationship between gender and the ordering of advertising placement requires further investigation before definite managerial recommendations can be made. Future studies may consider testing these effects across other types of advertising media (e.g. TV, radio), and should also expand the scope to other products or services, as well as other geographic locations.

Les Binet, the European Director of DDB Matrix, stated that "So much of what is written about marketing is based on ideas about how it SHOULD work. We've look at what actually DOES work, in hard business terms, and our findings suggest that a lot of received wisdom about marketing is actually quite misguided." Marketers in general pay too much attention to building brand awareness, and often forget to focus on changes in consumers' information processing behavior—while the latter is more difficult,

it is also vital to continued success. From a managerial perspective, emotional and rational appeals in advertising may not be truly mutually independent. In the current paper, we focus on gender-based differences toward advertising appeals; therefore, we do not manipulate the situation to include combined appeals. In light of this, future research in this area can study gender-based information processing of combined approach internet advertising.

Finally, most studies on internet advertising have been conducted by web-based publishers and utilized audience measurement data (i.e. number of site visits, exposure to banner ads). However, this kind of quantitative data does not improve our understanding of consumers' information processing techniques, such as why people click banner ads or why they click one banner ad more than another. As such, we recommend additional qualitative studies to allow for a clearer picture to emerge.

While E-commerce has grown substantially over the last several years, internet shopping continues to struggle to become a dominant retail channel. In conclusion, understanding the underlying information processing techniques related to web-based advertising can assist online marketers in many facets of their jobs. As such, additional studies in this area are strongly encouraged.

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